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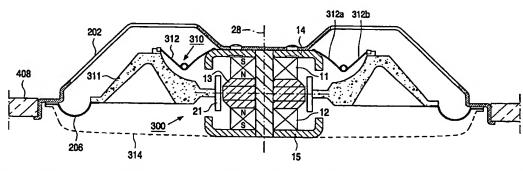
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(54) Title: ELECTROMAGNETIC DRIVING UNIT FOR A LOUDSPEAKER ASSEMBLY



(57) Abstract: Electromagnetic driving unit for a loudspeaker assembly provided with a frame (202) and a diaphragm (31). The driving unit comprises a magnet part and a coil part (21) for magnetic cooperation with the magnet part, the coil part being translatable along a translation axis with respect to the magnet part. The diaphragm (31) may extend from the coil part in a substantially radial direction with respect to the translation axis (23) of the coil part. The magnet part comprises two permanent magnets (11, 12) and an intermediate magnetic pole element (13) which is sandwiched between the permanent magnets when viewed along the translation axis of the coil part. In order to improve the efficiency of the driving unit, the magnet part further comprises two external magnetic pole elements (14, 13). The permanent magnets and the intermediate magnetic pole element are sandwiched between the external magnetic pole elements, all pole elements having pole faces which are magnetically directed towards the coil part.

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C. DOCUME	ENTS CONSIDERED TO BE RELEVANT		<del> </del>	
Category °	Citation of document, with indication, where appropriate, of the relevo	ant passages		Relevant to daim No.
X	PATENT ABSTRACTS OF JAPAN vol. 1998, no. 05, 30 April 1998 (1998-04-30) -& JP 10 023591 A (KENWOOD CORP),			1-5,7-9, 12
Υ	23 January 1998 (1998-01-23) abstract; figures 1,2			10,11
A	EP 0 835 040 A (KENWOOD CORP) 8 April 1998 (1998-04-08) abstract column 10, line 58 -column 11, lin figures 8,9	1,7-9,12		
	-/	<b>'</b>		
X Fur	her documents are listed in the continuation of box C.	X Patent tam	ly members are listed	in annex.
"A" docum const "E" earlier filing "L" docum which citalia "O" docum other	ent defining the general state of the art which is not dered to be of particular relevance document but published on or after the International date ent which may throw doubts on priority claim(s) or its cited to establish the publication date of another or other special reason (as specified) tent referring to an oral disclosure, use, exhibition or means tent published prior to the international filing date but	or priority date a cited to underst invention  K' document of part cannot be consi involve an inver y' document of part cannot be consi document is co ments, such co in the art.	icular relevance; the o	the application but soon underlying the soon underlying the beconsidered to current is taken alone stairned invention ventive step when the ore other such docupus to a person skilled
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#### INTERNATIONAL SEARCH REPORT

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		FCI/IB 03/01159
	ation) DOCUMENTS CONSIDERED TO BE RELEVANT	
Category *	Citation of document, with Indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	PATENT ABSTRACTS OF JAPAN vol. 2000, no. 20, 10 July 2001 (2001-07-10) & JP 2001 078293 A (KENWOOD CORP;MOGAMI DENKI CORP), 23 March 2001 (2001-03-23) cited in the application	10,11
A	abstract	1,9,12
A	PATENT ABSTRACTS OF JAPAN vol. 1999, no. 04, 30 April 1999 (1999-04-30) & JP 11 027772 A (KENWOOD CORP), 29 January 1999 (1999-01-29) abstract	1,3-6,9, 12
P,X	PATENT ABSTRACTS OF JAPAN vol. 2003, no. 02, 5 February 2003 (2003-02-05) & JP 2002 300694 A (KENWOOD CORP), 11 October 2002 (2002-10-11) abstract	1-5

## **INTERNATIONAL SEARCH REPORT**

PCT/IB 03/01159

Patent document cited in search report		Publication date		Patent family member(s)	Publication date
JP 10023591	Α	23-01-1998	JP	3271903 B2	08-04-2002
EP 0835040	Α	08-04-1998	JP EP DE DE DE EP WO US	5093197 U 0835040 A1 69332569 D1 69332569 T2 835040 T1 0587910 A1 9320666 A1 5594805 A	17-12-1993 08-04-1998 23-01-2003 21-08-2003 03-09-1998 23-03-1994 14-10-1993 14-01-1997
JP 2001078293	Α	23-03-2001	NONE	— — — — — — — — — — — — — — — — — — —	
JP 11027772 3	A		NONE		
JP 2002300694	Α	11-10-2002	NONE		